



Project Summary

Assessment of Existing Test Reports for Evaluating VOC Control Effectiveness

Brent W. Hall and Carl F. Singer

Volatile organic compound (VOC) control effectiveness has recently become highly visible in the surface coating industry. Work has been directed toward a fundamental understanding of the problem, along with development of a database addressing the subject. Recent work for the U.S. Environmental Protection Agency (EPA) has led to the analysis of existing test reports for evaluation of VOC control device effectiveness. The report presents the approach taken to review existing test reports and identify missing control device effectiveness information. A format to provide guidance and serve as the basis for all future databases involving VOC control effectiveness is also presented. Results indicate average control device efficiencies of 91 to 96% based on the method used and the device tested. Note that the populations considered in this task were small and geographically biased.

This Project Summary was developed by the National Risk Management Research Laboratory's Air Pollution Prevention and Control Division, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Background

In 1988, research to investigate the status of VOC emissions and to determine if VOC control devices were operating as designed was performed for EPA. The primary goal of the study was to assess VOC control device effectiveness and to determine if future efforts were needed in

this area. Results indicated that emerging and recurring problems with the control of VOCs needed further investigation. Subsequent studies were conducted to continue this work and to further define the problems associated with VOC control. Testing was performed during full-scale commercial operation of VOC control devices to begin developing a database to document the performance of control devices currently in operation. Efforts to develop this database proved short-lived, however, due to the costs associated with field testing devices.

After a short period of inactivity, it was decided to look for existing data on operational VOC control devices. The search led to a database being developed by EPA's Office of Air Quality Planning and Standards (OAQPS) for emission factor development. This database of field sampling test reports from state agencies and other sources was obtained from OAQPS for use in the current work.

Current Work

Current work focuses on reviewing existing test reports and identifying missing control device effectiveness information. Approximately 400 test records in dBASE III Plus format were obtained. These records were sorted based on predetermined criteria related to previous studies to identify controlled emissions from surface-coating plants. Four separate sorts yielded 63 test records that were related to VOCs and eliminated plants known not to be surface-coating industries. A control device of interest pertained to each of these 63 test records. These records were used throughout the remainder of the current work.

Another goal was to develop a format for future databases. This would provide guidance and serve as the basis for future databases involving VOC control effectiveness. The database would be used to make a summary page to be attached to the front of each emission source test report. This would facilitate finding information related to VOC control effectiveness for a particular plant or control device. In addition, the summary page would serve as a quick reference for track-

ing control device performance over a period of time.

After a database format was developed, control effectiveness data identified in this task were filled in for each test report. Several important items of information were consistently not found in reviewing the test reports including control device residence time and installation date. Pertinent information from the actual source test was also frequently missing or inadequate, including solvent usage rate and gas flow rates.

The average control device efficiency of catalytic incinerators was 92% based on EPA Method 25 type measurements of total gaseous non-methane organics (TGNMOs) and 95% based on EPA Method 25A type measurements of total hydrocarbons (THCs). The average control device efficiency of thermal incinerators was 96% based on TGNMOs and 91% based on THCs. Populations considered in this task were small and geographically biased.

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Chester A. Vogel is the EPA Project Officer (see below).

The complete report, entitled "Assessment of Existing Test Reports for Evaluating VOC Control Effectiveness," (Order No. PB99-175275; Cost: \$29.50, subject to change) will be available only from

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